

the material will be rejected unless the Engineer elects to accept it under Section 105.07.

This reduction will apply to lots of 10,000 tons, and will be applied independently of Section 410.05 A.1.

- C. Material for patching or leveling of an existing bituminous surface constructed under a previous contract shall be obtained from the tonnage provided in the basis of estimate and will be paid according to Section 408.07 C.

## **SECTION 411 MILLING PAVEMENT SURFACE**

### **411.01 DESCRIPTION.**

This work consists of improving the profile, cross slope, and surface texture of an existing pavement surface.

### **411.02 EQUIPMENT.**

The Milling Machine shall meet Section 152.05.

### **411.03 CONSTRUCTION REQUIREMENTS.**

The existing pavement surface shall be cleaned of deleterious material before the milling operation.

The milling shall be started at the centerline of the pavement and proceed on a longitudinal line parallel to the centerline. Succeeding passes shall progress toward the outer edge of the pavement unless a different sequence of operations is permitted by the Engineer. Milling shall progress in a manner that a single lane is not more than one day's run in advance of the adjacent lane. The Contractor may be required to alter the milling operation to best suit construction conditions. When the milling is stopped, the milled depth shall be gradually tapered to the original pavement surface.

The completed milled surface shall be free from transverse and longitudinal irregularities exceeding 1/4 inch when measured with a 10-foot straightedge.

The Contractor shall dispose of the milled material as indicated in the Contract.

When the material is stockpiled, the stockpile site shall be shown on the Plans or if not shown, the Contractor shall select the site. The stockpile site shall be prepared according to Section 405.02 A.

The Contractor shall clean the milled surface by brooming before opening to traffic.

The Contractor shall remove equipment, materials, and residue from the roadway according to Section 107.05.

The Contractor shall place the pavement overlay within 5 calendar days of milling the pavement surface. If the milled surface is not overlaid within the 5 calendar days, the Contractor will be responsible to repair any breakups, or damage that occurred to the roadway after it was milled. The materials and methods used to make the repairs shall be approved by the Engineer. The cost of such repairs will be the responsibility of the Contractor and will be incidental to other items.

#### **411.04 METHOD OF MEASUREMENT.**

- A. **Milling Pavement Surface.** Milling Pavement Surface shall be measured by the Ton or by the Square Yard. The labor, equipment, brooming, cleaning before and after milling, water used in milling, and depositing of the milled material on the roadbed or in a hauling unit, will not be measured for payment but will be considered incidental to the milling.
- B. **Prepare and Restore Stockpile Site.** Prepare and Restore Stockpile Site will be measured and paid for as one Lump Sum regardless of the number of sites used. The Lump Sum bid shall include payment for removal, stockpiling, and replacement of topsoil; shaping the site subgrade; furnishing, placing, shaping, removal, and disposal of six inches of aggregate bedding and all incidental items.
- C. **Stockpiled Surfacing.** Stockpiled Surfacing will be measured to the nearest 0.1 Ton of material weighed and placed in the stockpile. Loading, hauling, and stockpiling will not be measured but will be considered incidental to the pay item Stockpiled Surfacing.

When Stockpiled Surfacing is not a Bid Item, all loading, hauling, and stockpiling will be incidental to Milling Pavement Surfacing.

#### **411.05 BASIS OF PAYMENT.**

Payment will be made at the Contract Unit Price for the following:

<b>Pay Item</b>	<b>Pay Unit</b>
Milling Pavement Surface	Ton, Square Yard
Prepare and Restore Stockpile Site	Lump Sum
Stockpiled Surfacing	Ton

This payment will be full compensation for all labor, equipment, and materials necessary to complete the work.

## **SECTION 420 BITUMINOUS SEAL COAT**

#### **420.01 DESCRIPTION.**

This work consists of an application of bitumen followed by an application of cover coat material on a prepared surface.

**420.02 MATERIALS.**

- A. **Bitumen.** The type and grade of bitumen will be specified in the Contract. The Field Engineer will determine the actual amount of bitumen to be used based on the chip size.

The bitumen shall meet and will be accepted according to Section 818. The bitumen will be conditionally accepted to the Project and sampled by the Contractor, according to the Department's procedures and under observation of the Engineer. The Department will test the bitumen according to the Department's procedures.

- B. **Cover Coat Material.** Cover Coat Material shall meet Section 816 for the class specified. The Department will determine the point of acceptance for the cover coat material and test it according to the Department's procedures.

A lot is defined as 1,200 tons of material. If plan quantity is less than 1,200 tons, a lot will be equal to plan quantity. If the final lot is less than 600 tons, it will be included in the previous lot, if the final lot is 600 tons or greater it will be a separate lot.

Three random samples will be taken for each lot of material. These samples will be tested and the material accepted if the average of the three samples meets the gradation specified. When the average of the three samples does not meet the gradation specified, a reduction in the Contract Unit Price will be made. If the aggregate fails to meet the specified gradation on one or more sieves, the reduction will be the sum of the deductions. The Unit Price Adjustment will be as calculated below.

Unit Price Reduction: Percent of Deduction =  $5 \times$  percent of deviation from range limits.

If the tested material deviates from the specified gradation for two consecutive lots, incorporation of additional material into the work will not be allowed until the Contractor takes the necessary corrective action to meet the specifications.

- C. **Blotter Material.** Blotter material shall meet Section 816. The Department will determine the point of acceptance for the blotter material and test it according to the Department's procedures.

**420.03 EQUIPMENT.**

Equipment shall meet the following:

Item	Section
General	151.01
Material-Hauling Equipment	151.03 B
Self-Propelled Pneumatic-Tired Rollers	151.02 B
Liquid Bitumen Distributors	151.05
Heating Equipment for Bitumen	152.01 B
Aggregate Spreader	151.06
Asphalt Transporter	152.06

**420.04 CONSTRUCTION REQUIREMENTS.**

- A. **Preparation of Surface.** Bitumen shall not be spread until the surface has been cleaned and the section has been approved.

Where the surface is broken or shows instability, the Contractor shall make the necessary repairs before placing the bitumen.

Where seal work is the only Contract item, repairs shall be done according to Section 104.03 D.

Where the surfacing and seal coat are included in the same Contract, surface repair work will not be paid for unless the Engineer determines the damage was through no fault of the Contractor, in which case repairs shall be done according to Section 104.03 D.

- B. Application of Bitumen.** Bitumen shall be applied with a pressure distributor in a uniform, continuous spread. The quantity of bitumen to be used per square yard shall be as directed by the Engineer. Any skipped areas or deficiencies shall be corrected. Junctions of spreads shall be carefully made to assure a smooth riding surface and complete cover.

Streaking of the bitumen on the road surface will not be allowed. Streaking is the non-uniform application of bitumen leaving alternating lean and heavy narrow bands of bitumen. If the Engineer determines that streaking is occurring, the Contractor shall cease operations until the Engineer is satisfied that streaking has been eliminated.

The surfaces of all structures and other appurtenances shall be protected against splattering. If splattering occurs, it shall be removed to the satisfaction of the Engineer at the Contractor's expense.

When traffic is maintained, the bitumen shall be applied in passes of approximately 1/2 the width of the completed surface. If the width of the surface makes such application impracticable, the bitumen may be applied in more than 2 passes.

The bitumen shall be applied so that when covered the overlaps caused by successive applications will not result in ridges or depressions at the transverse or longitudinal joints. The joints shall be smooth and consistent with the adjacent completed surface treatment.

To prevent lapping at transverse junctions, the bitumen spray shall be promptly shut off at the end of the application. Before continuing the application, building paper or metal sheets shall be spread a sufficient distance back from the joint on the cover aggregate so the sprayers are operating at full force when the distributor has attained the predetermined speed upon reaching the uncovered surface. All paper or metal sheets used shall be removed.

- C. Cover Coat Material Application.** The cover coat material shall be spread uniformly over the bituminous material with an aggregate spreader. Small areas inaccessible to the aggregate spreader may be covered by hand or other approved methods.

The quantities of cover coat material shown are based on estimated rates. The actual coverage rates will be determined by the Engineer.

Immediately after the cover coat material is spread, any deficient areas shall be covered by additional cover coat material or blotter material as directed by the Engineer.

Rolling shall begin immediately behind the spreader and shall continue until a minimum of four complete coverages are obtained. The speed of the roller shall not exceed 7 MPH on the initial coverage. A self-propelled pneumatic-tired roller shall be used to complete the rolling.

The loose cover coat material shall be lightly broomed off during the cool period of early morning within 36 to 48 hours from the time of application. The broom shall have a positive means of controlling the vertical pressure on the broomhead. Care shall be taken to avoid dislodging embedded aggregate. A final brooming shall be accomplished at the end of the maintenance period.

Excess material in curb and gutter sections shall be broomed toward the gutter and shall be picked up and disposed of by the Contractor.

1. **Requirements for Cutback Asphalts.** When using a cutback asphalt, the cover coat material shall be flushed with clear water and be well drained before it is applied to the roadway.

The cover coat aggregate shall be applied immediately following application of the bitumen.

2. **Requirements for High Float Emulsified Asphalts.** When using a high float emulsified asphalt, the cover coat material shall be flushed with water, well drained, and visibly damp when applied to the roadway.

The cover coat material shall be applied when a surface skin develops on the emulsion. The surface skin is developed when the surface of the high-float emulsion is black while a brown color remains beneath the surface. Dependent upon weather conditions, the surface skin should form in 5 to 15 minutes after application of the emulsion to the roadway.

3. **Requirements for Cationic Emulsions.** When using a cationic emulsion, the cover coat material shall be flushed with clear water and be well drained before it is applied to the roadway.

The cover coat aggregate shall be applied within 1 minute following application of the bitumen. If an application of emulsified asphalt is not covered before it begins to break, corrective action will be required by the Contractor at no cost to the Department.

- D. **Blotter Material Application.** The application of blotter material may be necessary to correct "bleeding." Blotter material shall be applied in the quantity and manner approved by the Engineer.

- E. **Protection of Traffic and Preservation of the Seal Coat.** The Contractor shall furnish flagpersons, pilot cars, signs, and lights according to Section 704.

On two-lane, two-way traffic highways, the Contractor shall provide additional flaggers and signs at each end of the seal operation and at major intersections within the seal operation area, to alert the traveling public to the hazards of flying chips. These flaggers and signs will be in addition to the flaggers used with the pilot car at the seal operation. The additional flaggers shall be placed immediately beyond the daily seal operation area or outside the sealed area that presents a haz-

ard with flying chips. The flaggers will be on the project during the seal coat application operation when a pilot car is being used. The flaggers shall provide each motorist with a notice printed on a sheet of paper a minimum of 3" × 5" in size similar to the following:

THIS HIGHWAY IS BEING RESURFACED WITH A CHIP SEAL COAT.

EXCESSIVE SPEED WILL CAUSE FLYING CHIPS WHICH COULD RESULT IN CHIPPED PAINT OR GLASS ON YOUR VEHICLE OR TO OTHER VEHICLES. ASPHALT MAY ALSO BE SPLATTERED ON YOUR VEHICLE.

REDUCE YOUR SPEED TO 40 MPH OR LESS. ANOTHER FLAGGER AND A PILOT CAR WILL ESCORT YOU AROUND THE SEAL COAT APPLICATION AREA.

The DO NOT PASS, NO CENTERLINE STRIPE, FRESH OIL LOOSE ROCK, and SPEED LIMIT signs shall remain covered until the chip seal operation is within 3 miles of that portion of the project.

On four-lane highways the additional flaggers and printed notices will not be required.

The seal coat shall be maintained by the Contractor during the seal coat operation and maintenance shall continue for an additional 5 calendar days after completion of the seal coat work. The Contractor shall repair the seal coat within 2 hours of the time the need for such repairs are noted.

Maintenance of the seal coat may require application of blotter sand to prevent bleeding, application of more bitumen, application of more seal aggregate, and additional rolling. The blotter sand shall be applied with a mechanical spreader such as a tailgate sander or other approved device. The sweeping of loose cover coat material from the shoulder onto the new sealed surface will not be permitted.

As soon as practicable after sealing and no later than 5 days after the seal has been applied, all excess cover coat material shall be swept and removed from the entire surface as directed by the Engineer.

#### F. **Limitations.**

1. **Weather.** Bitumen shall not be applied on a wet surface or when weather conditions would prevent the proper construction of the seal coat. Seal work will not be permitted when the pavement temperature is below 70°F.

Seal work shall not be started after September 1.

2. **Operational.** Each type of surface listed below shall be allowed a curing period after laydown and compaction has been completed as follows:
  - a. Prime coat — 4 days.
  - b. SC, MC or RC Pavements — 15 days.

- c. Asphalt Cement Pavements — 7 days.
- d. Emulsion Pavements — 15 days.

These curing periods may be increased or decreased by written permission of the Engineer.

Sealing work shall not be permitted at night. Unless otherwise authorized by the Engineer, the work shall be scheduled so that the last application of the day shall be placed in time for the bitumen to cure sufficiently to allow installation of the short-term pavement marking before sunset, as specified in Section 762.04 D.1.

#### **420.05 METHOD OF MEASUREMENT.**

- A. **Bitumen.** Bitumen will be measured by the Ton or Gallon.
- B. **Cover Coat Material and Blotter Material.** Cover Coat Material and Blotter Material will be measured by the Ton or Cubic Yard or for urban projects, Square Yard, according to Section 109.

#### **420.06 BASIS OF PAYMENT.**

Payment will be made at the Contract Unit Price for the following:

<b>Pay Item</b>	<b>Pay Unit</b>
---Liquid Asphalt	Ton or Gallon
---Emulsified Asphalt	Ton or Gallon
Cover Coat Material Class----	Ton or Cubic Yard or Square Yard
Blotter Material	Ton or Cubic Yard

This payment will be full compensation for all labor, equipment, and materials necessary to complete the work. The cost of flushing the cover coat material with water shall be incidental to the cost of the Contract Unit Price Bid for cover coat material.

If the bid item "Blotter Material" is not included as a pay item in the Contract, payment will be made at the rate specified in the Price Schedule (PS-1) in the Proposal.